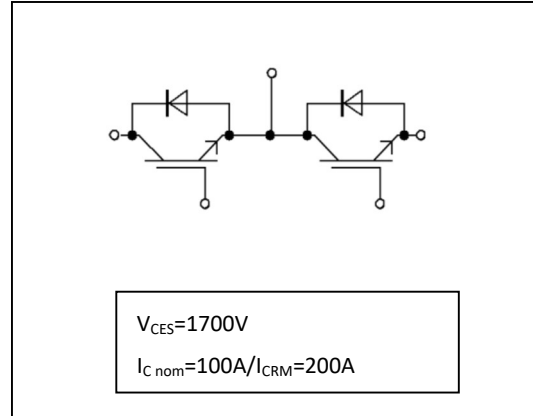


1700V 100A IGBT Half Bridge Module

1700V 100A IGBT 半桥模块



Features:

- 1700V Trench Gate & Field Stop Structure
- High Short Circuit Capability
- Low Switching Loss
- High Reliability
- Positive Temperature Coefficient

产品特性:

- 1700V沟槽栅及场截止结构
- 高短路耐量
- 低开关损耗
- 高可靠性
- 正温度系数

Typical Applications:

- Motor Drives
- Servo Drives
- Inverter and Power Supplies
- Photovoltaic

典型应用:

- 电机传动
- 伺服驱动器
- 逆变器和电源
- 光伏发电

IGBT, Inverter/IGBT, 逆变器

Maximum Rated Values/最大额定值

Item	Symbol	Conditions	Value	Units
集电极-发射极电压 Collector-emitter voltage	V_{CEs}	$T_{vj}=25^{\circ}C$	1700	V
连续集电极直流电流 Continuous DC collector current	$I_{c\ nom}$		100	A
集电极重复峰值电流 Peak repetitive collector current	I_{CRM}	$t_p=1ms$	200	A
总功率损耗 Total power dissipation	P_{tot}	$T_c=25^{\circ}C, T_{vjmax}=175^{\circ}C$	600	W
栅极-发射极峰值电压 Maximum gate-emitter voltage	V_{GES}		± 20	V
最高结温 Maximum junction temperature	$T_{vj,max}$		175	$^{\circ}C$

Characteristic Values /特征值

Item	Symbol	Conditions	Min.	Typ.	Max.	Units
集电极-发射极饱和电压 Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_c=100A, V_{GE}=15V$	$T_{vj}=25^{\circ}C$	1.67		V
			$T_{vj}=125^{\circ}C$	1.91		V
			$T_{vj}=150^{\circ}C$	1.97		V
栅极阈值电压 Gate threshold voltage	$V_{GE(th)}$	$I_c=17mA, V_{CE}=V_{GE}, T_{vj}=25^{\circ}C$	5.0	5.9	6.8	V
栅极电荷 Gate charge	Q_G	$V_{GE}=-15V...+15V$		1.38		μC
内部栅极电阻 Internal gate resistor	R_{Gint}	$T_{vj}=25^{\circ}C$		10		Ω
输入电容 Input capacitance	C_{ies}	$f=1MHz, T_{vj}=25^{\circ}C, V_{CE}=25V, V_{GE}=0V$		8.98		nF
反向传输电容 Reverse transfer capacitance	C_{res}	$f=1MHz, T_{vj}=25^{\circ}C, V_{CE}=10V, V_{GE}=0V$		0.15		nF
集电极-发射极截止电流 Collector-emitter cut-off current	I_{CES}	$V_{CE}=1700V, V_{GE}=0V, T_{vj}=25^{\circ}C$			3.00	mA
栅极-发射极漏电流 Gate-emitter leakage current	I_{GES}	$V_{CE}=0V, V_{GE}=20V, T_{vj}=25^{\circ}C$			400	nA
开通延迟时间(电感负载) Turn-on delay time, inductive load	$t_{d(on)}$		$T_{vj}=25^{\circ}C$	251		ns
			$T_{vj}=125^{\circ}C$	346		ns
			$T_{vj}=150^{\circ}C$	272		ns
上升时间(电感负载) Rise time, inductive load	t_r		$T_{vj}=25^{\circ}C$	64		ns
			$T_{vj}=125^{\circ}C$	75		ns
			$T_{vj}=150^{\circ}C$	78		ns
关断延迟时间(电感负载) Turn-off delay time, inductive load	$t_{d(off)}$	$I_c=100A, V_{CE}=900V$ $V_{GE}=\pm 15V$ $R_{Gon}=4\Omega$	$T_{vj}=25^{\circ}C$	419		ns
			$T_{vj}=125^{\circ}C$	509		ns
			$T_{vj}=150^{\circ}C$	526		ns
下降时间(电感负载) Fall time, inductive load	t_f	$R_{Goff}=4\Omega$ Inductive Load,	$T_{vj}=25^{\circ}C$	863		ns
			$T_{vj}=125^{\circ}C$	1063		ns
			$T_{vj}=150^{\circ}C$	1197		ns
开通损耗能量(每脉冲) Turn-on energy loss per pulse	E_{on}		$T_{vj}=25^{\circ}C$	16.1		mJ
			$T_{vj}=125^{\circ}C$	23.2		mJ
			$T_{vj}=150^{\circ}C$	25.4		mJ
关断损耗能量(每脉冲) Turn-off energy loss per pulse	E_{off}		$T_{vj}=25^{\circ}C$	19.1		mJ
			$T_{vj}=125^{\circ}C$	25.1		mJ
			$T_{vj}=150^{\circ}C$	27.4		mJ
短路数据 SC data	I_{sc}	$V_{GE}\leq 15V, V_{CC}=1000V$ $V_{CEmax}=V_{CES}-L_{sCE}\cdot di/dt, t_p=10\mu s, T_{vj}=150^{\circ}C$		400		A

结-外壳热阻 Thermal resistance, junction to case	R_{thJC}	Per IGBT / 每个 IGBT	0.26	K/W
工作温度 Temperature under switching conditions	T_{vjop}		-40	150 °C

Diode, Inverter/二极管, 逆变器

Maximum Rated Values / 最大额定值

Item	Symbol	Conditions	Value	Units
反向重复峰值电压 Peak repetitive reverse voltage	V_{RRM}	$T_{vj}=25^{\circ}C$	1700	V
连续正向直流电流 Continuous DC forward current	I_F		100	A
正向重复峰值电流 Peak repetitive forward current	I_{FRM}	$t_p=1ms$	200	A

Characteristic Values/特征值

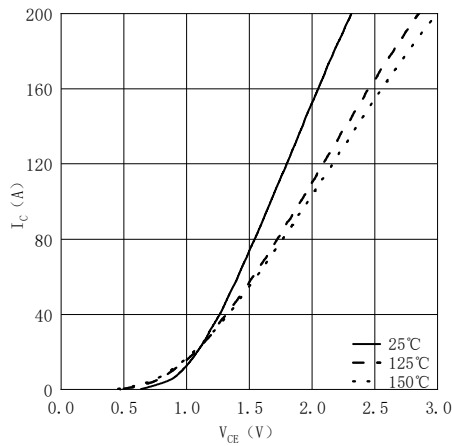
Item	Symbol	Conditions	Min.	Typ.	Max.	Units
正向电压 Forward voltage	V_F	$I_F=100A$	$T_{vj}=25^{\circ}C$	2.06	2.40	V
			$T_{vj}=125^{\circ}C$	2.28		V
			$T_{vj}=150^{\circ}C$	2.25		V
反向恢复峰值电流 Peak reverse recovery current	I_{RM}	$I_F=100A$	$T_{vj}=25^{\circ}C$	101		A
			$T_{vj}=125^{\circ}C$	109		A
			$T_{vj}=150^{\circ}C$	111		A
恢复电荷 Recovery charge	Q_r	$-di_F/dt_{off}=3000A/\mu s$ $V_R=900V$ $V_{GE}=-15V$	$T_{vj}=25^{\circ}C$	16		μC
			$T_{vj}=125^{\circ}C$	25.6		μC
			$T_{vj}=150^{\circ}C$	27.9		μC
反向恢复损耗 (每脉冲) Reverse recovery energy (per pulse)	E_{rec}		$T_{vj}=25^{\circ}C$	9.6		mJ
			$T_{vj}=125^{\circ}C$	15.2		mJ
			$T_{vj}=150^{\circ}C$	16.2		mJ
结-外壳热阻 Thermal resistance, junction to case	R_{thJC}	Per diode / 每个二极管			0.42	K/W
工作温度 Temperature under switching conditions	T_{vjop}		-40		150	°C

Module / 模块

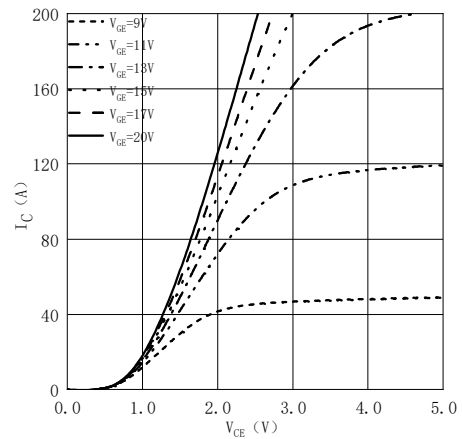
Item	Symbol	Conditions	Value	Units
绝缘测试电压 Isolation test voltage	V_{ISOL}	RMS, f=50Hz, t=1min	4.0	kV
模块基板材料 Material of module base plate			Cu	
内部绝缘 Internal isolation		基本绝缘 (class 1, IEC 61140) Basic insulation(class1,IEC61140)	Al_2O_3	
爬电距离 Cree page distance		端子-散热片/terminal to heat sink 端子-端子/terminal to terminal	17.0 20.0	mm
电气间隙 Clearance		端子-散热片/terminal to heat sink 端子-端子/terminal to terminal	17.0 9.5	mm
相对电痕指数 Comparative tracking index	CTI		>200	

Item	Symbol	Conditions	Min.	Typ.	Max.	Units
杂散电感, 模块 Stray inductance module	L_{SCE}			30		nH
模块引脚电阻, 端子-芯片 Module lead resistance, Terminals-Chip	R_{CC+EE} R_{AA+CC}			0.65		m Ω
储存温度 Storage temperature	T_{stg}		-40		125	$^{\circ}C$
模块安装的安装扭矩 Mounting torque for module mounting	M	M6	3.00		5.00	Nm
端子联接扭矩 Terminal connection torque	M	M5	2.50		5.00	Nm
重量 Weight	G			160		g

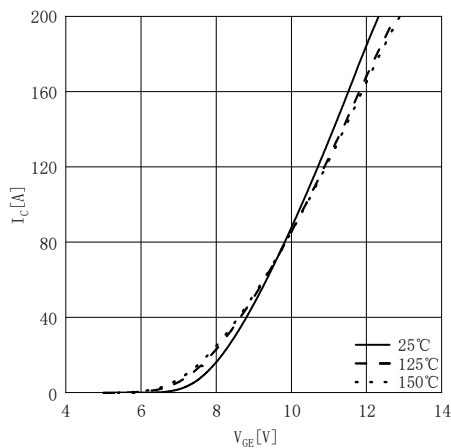
输出特性 IGBT, 逆变器 (典型)
Output characteristic IGBT, Inverter (typical)
 $I_C = f(V_{CE})$
 $V_{GE} = 15V$



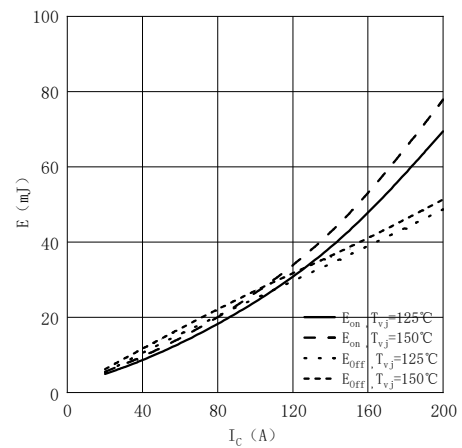
输出特性 IGBT, 逆变器 (典型)
Output characteristic IGBT, Inverter (typical)
 $I_C = f(V_{CE})$
 $T_{vj} = 150^\circ C$



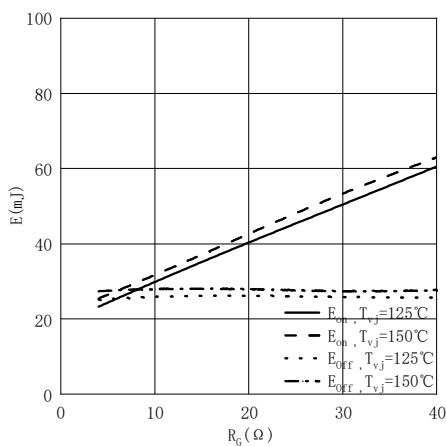
传输特性 IGBT, 逆变器(典型)
Transfer characteristic IGBT, Inverter (typical)
 $I_C = f(V_{GE})$
 $V_{CE} = 20V$



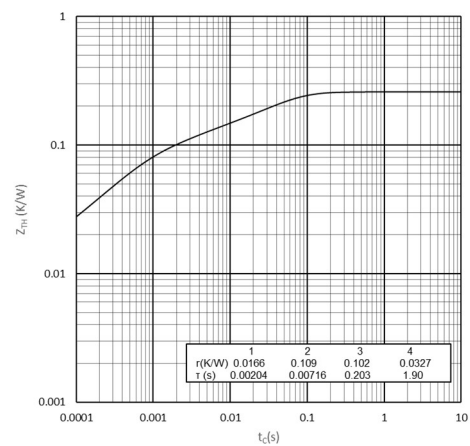
开关损耗 IGBT, 逆变器 (典型)
Switching losses IGBT, Inverter (typical)
 $E = f(I_C)$
 $V_{GE} = \pm 15V, R_G = 4 \Omega, V_{CE} = 900V$



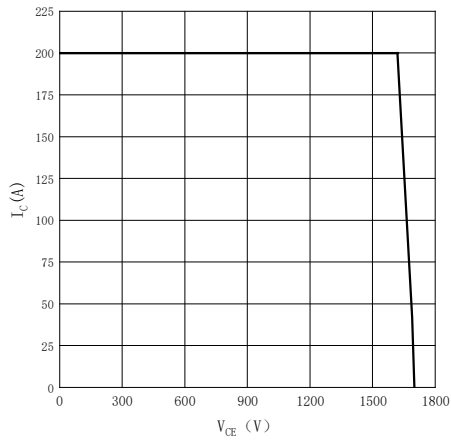
开关损耗 IGBT, 逆变器 (典型)
Switching losses IGBT, Inverter (typical)
 $E = f(R_G)$
 $V_{GE} = \pm 15V, I_C = 100A, V_{CE} = 900V$



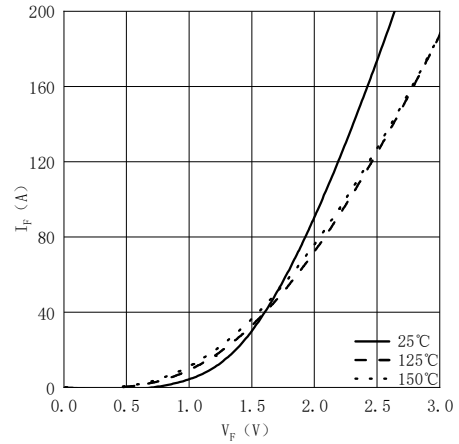
瞬态热阻抗 IGBT, 逆变器
Transient thermal impedance IGBT, Inverter
 $Z_{thc} = f(t)$



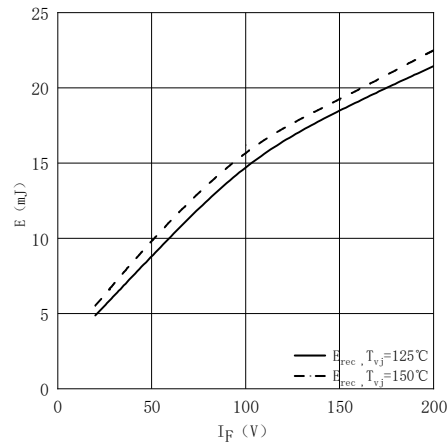
反偏安全工作区 IGBT, 逆变器 (RBSOA)
Reverse bias safe operating area IGBT, Inverter (RBSOA)
 $I_C = f(V_{CE})$
 $V_{GE} = \pm 15V, R_{Goff} = 4\Omega, T_{vj} = 150^\circ C$



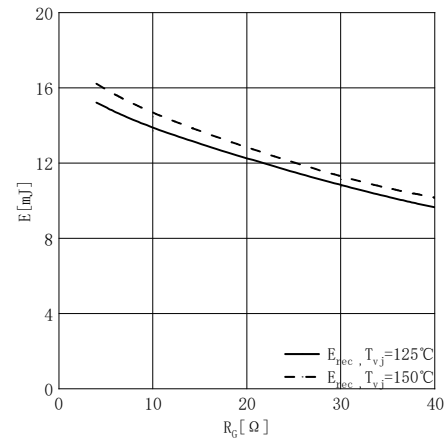
正向偏压特性 二极管, 逆变器 (典型)
Forward characteristic of Diode, Inverter (typical)
 $I_F = f(V_F)$



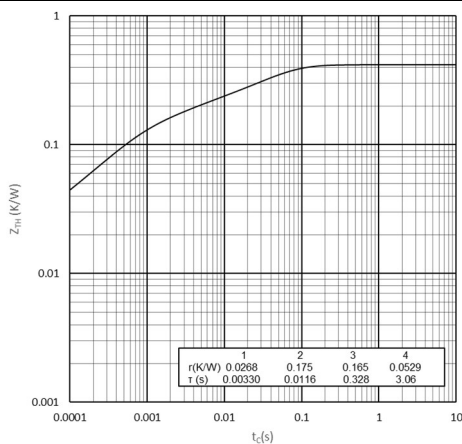
开关损耗 二极管, 逆变器 (典型)
Switching losses Diode, Inverter (typical)
 $E_{rec} = f(I_F)$
 $R_G = 4\Omega, V_{CE} = 900V$



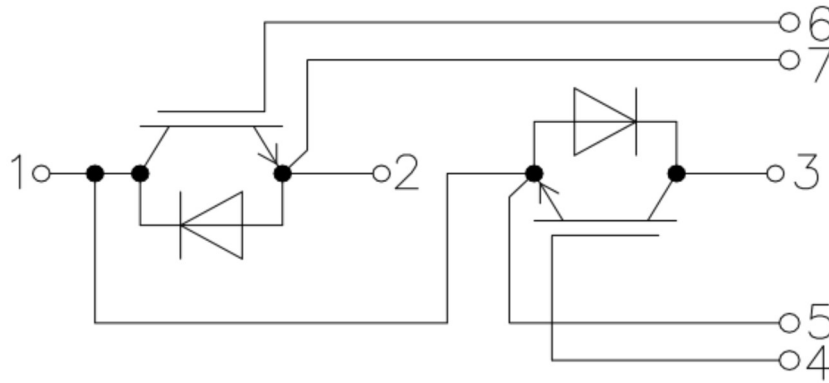
开关损耗 二极管, 逆变器 (典型)
Switching losses Diode, Inverter (typical)
 $E_{rec} = f(R_G)$
 $I_F = 100A, V_{CE} = 900V$



瞬态热阻抗二极管, 逆变器
Transient thermal impedance Diode, Inverter
 $Z_{thJC} = f(t)$



Circuit diagram headline / 接线图



Package outlines/封装尺寸

